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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/610,486	06/30/2003	Eric J. Horvitz	MS303530.1 / MSFTP471US	5347

27195 7590 07/28/2008

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EXAMINER	
ADDY, THUAN KNOWLIN	

ART UNIT	PAPER NUMBER
2614	

NOTIFICATION DATE	DELIVERY MODE
07/28/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/610,486	HORVITZ ET AL.	
	Examiner	Art Unit	
	THJUAN K. ADDY	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 December 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02/13/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed on April 10, 2008 has been entered. Claims 1, 19, and 20 have been amended. No claims have been cancelled. No claims have been added. Claims 1-36 are still pending in this application, with claims 1, 19, 20 being independent.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-10 and 12-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Joseph et al. (US 6,807,274), in view of Bala (US 6,798,876), and further in view of Holt (US 5,896,448).

4. In regards to claims 1 and 18, Joseph discloses an automated call routing system (See Abstract and col. 2 lines 23-31) and computer readable medium, comprising: an automated call routing component to route an incoming call to a member (e.g., customer service representative) of an organization (e.g., call center) and provide automated response (e.g., automated dialog) to one or more callers (e.g., customer) (See Abstract and col. 2 lines 23-31); and a decision (e.g., routing decision) model associated with the automated call routing component to mitigate transferring the calls to an operator (e.g., live service representative) (See col. 2 lines 23-35). Joseph,

however, does not disclose a decision model, associated with the automated call routing component, that employs probability to determine likelihood of success in automatically routing the incoming call, the likelihood of success determined based in part on a sequence of system actions from the incoming call as compared to system actions of one or more previous calls, to mitigate transferring the calls to an operator. Bala, however, does disclose a decision model (See Fig. 1 and statistical modeling software/module 135), associated with the automated call routing component (See Fig. 1 and PBX/ACD 130), that employs probability to determine likelihood of success in automatically routing the incoming call (See col. 3 lines 51-61), the likelihood of success determined based on a sequence of system actions (e.g., list of question presented to the caller prior to routing the call and/or prompting the caller to identify the product or service that is needed) from the incoming call as compared to system actions of one or more previous calls (for example, the system actions may be based on how successfully a customer service representative handled a call in the past pertaining to the selected product/service, or on what products/services were ordered by the customer in the past, {See Bala, col. 4 lines 30-65}; furthermore, Holt teaches that the system actions may be based on the probability of successfully routing the call, based on previous call attempts, {See col. 5 lines 20-33 and col. 7-8 lines 64-7}), to mitigate transferring the calls to an operator (See Fig. 1 and attendant/customer service representative 180 and 181) (See col. 2 lines 24-33, col. 2-3 lines 66-13, and col. 4 lines 26-33, of Bala). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate this feature within the system, as a way of

specifically routing a call based on the need of the caller and the profile of the call center representative, thus providing a more accurate and user friendly call routing environment. However, Joseph, nor Bala, disclose the likelihood of success determined based in part on a sequence of system actions associated with the incoming call and is re-determined after the occurrence of each system action from the incoming call, to mitigate transferring the incoming call to an operator. Holt, however, does disclose the likelihood of success (See col. 5 lines 20-33) determined based in part on a sequence of system actions (for example, the sequence of system actions may simply be the sequential dialing of each destination number within the routing list, See col. 3-4 lines 65-6) associated with the incoming call and is re-determined (e.g., updated) after the occurrence of each system action (for example, the likelihood of success of reaching each destination number is updated after each destination is dialed) from the incoming call, to mitigate transferring the incoming call to an operator (e.g., subscriber) (See col. 4 lines 27-46 and col. 7-8 lines 64-10). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention, to incorporate these features within the system, as a way of providing a method to update dynamically the order that a list of numbers is called in order to successfully route calls to a subscriber within the communication system.

5. In regards to claims 2 and 6, Joseph discloses the system, further comprising a speech recognition component (e.g., Interactive Voice Response (IVR) system) for communicating with the callers (See col. 2 lines 14-22).

6. In regards to claim 3, Joseph discloses all of claim 3 limitations, except the system, the decision model is trained from a data log that has recorded data of past activities and interactions with the automated call routing component. Bala, however, does disclose the decision model is trained from a data log that has recorded data of past activities and interactions with the automated call routing component (See col. 3 lines 24-29 and col. 4 lines 36-61).

7. In regards to claim 4, Joseph discloses all of claim 4 limitations, except the system, the data log contains data relating to at least one of a Speaker Found, a Speaker Not Found, an OperatorRequest, a Help Request, a Hang Up, a Maximum number of Errors, a Not Ready indication, and an Undefined category. Bala, however, does disclose the data log contains data relating to at least one of a Speaker Found, a Speaker Not Found, an OperatorRequest, a Help Request, a Hang Up, a Maximum number of Errors, a Not Ready indication, and an Undefined category, or a combination thereof (See col. 3 lines 24-29 and col. 4 lines 40-48).

8. In regards to claim 5, Joseph discloses the system, the decision model processes one or more dialog features including at least one of system and user actions, session summary feature, n-best recognitions features, and generalized temporal features, or a combination thereof (See Abstract and col. 2 lines 14-22).

9. In regards to claim 7, Joseph discloses all of claim 7 limitations, except the system, the decision model employs a probability tree to determine the likelihood of success in automatically routing the incoming call given a sequence of system actions. Bala, however, does disclose the decision model employs a probability tree to

determine the likelihood of success in automatically routing the incoming call given a sequence of system actions (See col. 2 lines 24-33, col. 2-3 lines 66-13, col. 3 lines 51-61, and col. 4 lines 26-33).

10. In regards to claim 8, Joseph disclose all of claim 8 limitations, except the system, the decision model determines the likelihood of success based on p(SpeakFoundIE), wherein SpeakFound is the member, E is observational evidence of system actions taken, and p is a probability, in part by counting a number of logged cases along an action sequence that resulted in success over a total number of cases along the sequences. Although, Bala, does not specifically disclose the decision model determines the likelihood of success based on p(SpeakFoundIE), wherein SpeakFound is the member, E is observational evidence of system actions taken, and p is a probability..., Bala does disclose the decision model determines the likelihood of success based in part by counting a number of logged cases along an action sequence that resulted in success over a total number of cases along the sequences (See col. 3 lines 24-29, col. 4 lines 40-48, and col. 4 lines 58-61). Holt, also discloses determining the likelihood of success based on a success counter and a failure counter, which indicate the probability of successfully routing the call to a particular destination number (See col. 4 lines 27-38).

11. In regards to claims 9 and 10, Joseph discloses the system, the decision model employs a dependency network that processes one or more categories of dialog (e.g., questions/queries) features as input variables (See col. 2-3 lines 44-5).

12. In regards to claim 12, Joseph discloses the system, further comprising a component to increase an amount of data in order to boost a partial model for dialog turns over a marginal model (See col. 2 lines 23-31 and col. 3-4 lines 66-16).

13. In regards to claims 13, 24, 32, and 33, Joseph discloses the system and method, the decision model includes at least one probabilistic model to perform at least one dynamic decision associated with costs and benefits of shifting a caller to human operator (See col. 1 lines 45-53).

14. In regards to claims 14 and 35, Joseph discloses the system and method, the at least one probabilistic model provides at least one prediction about an outcome to enable administrators of automated call routing systems to specify preferences regarding the transfer of callers to a human operator (See col. 3-4 lines 66-16).

15. In regards to claims 15, 16, 21, and 34, Joseph discloses the system and method, the preferences are represented as a tolerated threshold on failure as a function of a current expected time that callers have to wait for a human operator, given a current load on operators (See col. 3 lines 14-27 and col. 3 lines 39-57).

16. In regards to claims 17 and 25, Joseph discloses the system and method, the queue is optimized based on queue-theoretic formulation (See col. 4 lines 9-16).

17. In regards to claim 19, Joseph discloses a system that facilitates call routing, comprising: means for interacting with a caller (e.g., customer) making a call to a user (e.g., customer service representative); means for automatically directing the caller to the user; and means for performing a decision theoretic analysis before directing the caller to the user (See Abstract and col. 2 lines 23-35), the decision-theoretic includes a

cost-benefit analysis weighing the benefits of transferring the caller to an operator (See col. 1 lines 45-53). Joseph, however, does not disclose means for determining probability of success in automatically directing the caller to the user, the probability of success determined based in part on a sequence of system actions associated with the call. Bala, however, does disclose means for determining probability of success in automatically directing the caller (See Fig. 1 and caller 101) to the user (See Fig. 1 and attendant/customer service representative 180 and 181), the probability of success determined based in part on a sequence of system actions (e.g., list of question presented to the caller prior to routing the call and/or prompting the caller to identify the product or service that is needed) associated with the call (See col. 2 lines 24-33, col. 2-3 lines 66-13, and col. 4 lines 26-33) and evaluating temporal features of past system calls as well as evaluating outcome of the past system calls (for example, the system actions may be based on how successfully a customer service representative handled a call in the past pertaining to the selected product/service, or on what products/services were ordered by the customer in the past, {See Bala, col. 4 lines 30-65}; furthermore, Holt teaches that the system actions may be based on the probability of successfully routing the call, based on previous call attempts, {See col. 5 lines 20-33 and col. 7-8 lines 64-7}). However, Joseph, nor Bala disclose, the probability of success is re-determined after each system action. Holt, however, does disclose the probability of success is re-determined (e.g., updated) after each system action (for example, the likelihood of success of reaching each destination number is updated after each destination is dialed) (See col. col. 4 lines 27-46 and col. 7-8 lines 64-10).

18. In regards to claim 20, Joseph disclose a method for automatically routing calls, comprising: determining a utility model for employment with a call routing system; and automatically directing the call to at least one of the organization member (e.g., customer service representative) or an operator (See Abstract and col. 2 lines 23-35). Joseph, however, does not disclose training the utility model from a log of past system call activities; employing probability to determine likelihood of success in automatically directing a call an organization member, the likelihood of success determined based in part on a sequence of system actions associated with the call; and automatically directing the call to at least one of the organization member or an operator, based in part on the likelihood of success. Bala, however, does disclose training the utility model from a log of past system call activities; employing probability to determine likelihood of success in automatically directing a call an organization member, the likelihood of success determined based in part on a sequence of system actions (e.g., list of question presented to the caller prior to routing the call and/or prompting the caller to identify the product or service that is needed) from the callas related to the utility model (for example, the system actions may be based on how successfully a customer service representative handled a call in the past pertaining to the selected product/service, or on what products/services were ordered by the customer in the past, {See Bala, col. 4 lines 30-65}; furthermore, Holt teaches that the system actions may be based on the probability of successfully routing the call, based on previous call attempts, {See col. 5 lines 20-33 and col. 7-8 lines 64-7}); and automatically directing the call to at least one of the organization member or an operator, based in part on the likelihood of success

(See col. 2 lines 24-33, col. 2-3 lines 66-13, col. 4 lines 26-33, col. 4 lines 40-48, and col. 4 lines 58-61). However, Joseph, nor Bala, disclose the likelihood of success determined based in part on a sequence of system actions associated with the call and is re-determined after the occurrence of each system action according to the utility model. Holt, however, does disclose the likelihood of success determined based in part on a sequence of system actions (for example, the sequence of system actions may simply be the sequential dialing of each destination number within the routing list, See col. 3-4 lines 65-6) associated with the call and is re-determined (e.g., updated) after the occurrence of each system action (for example, the likelihood of success of reaching each destination number is updated after each destination is dialed) (See col. 4 lines 27-46 and col. 7-8 lines 64-10).

19. In regards to claims 22, 23, and 26, Joseph discloses the method, further comprising processing user frustrations (See col. 1 lines 55-61).

20. In regards to claims 27-31, Joseph discloses all of claims 27-31 limitations, except the specific formulas recited in claims 27-31. Joseph, however, does disclose formulas (See col. 4 lines 8-16 and col. 4 lines 35-58) that produce the same results that the present invention is attempting to obtain, in claims 27-31. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the use of these formulas within the system, as a way of calculating the "wait" time that a call is expected to be held in queue before being answered by a customer service representative.

21. In regards to claim 36, Joseph discloses the method, supporting an application including at least one of touch-tone and speech recognition (See col. 2 lines 20-22).

22. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Joseph et al (US 6,807, 274), in view of Bala (US 6,798,876), in view of Holt (US 5,896,448), and further in view of Chittineni (US 4,747,054).

23. In regards to claim 11, Joseph, Bala, and Holt disclose all of claim 11 limitations, except the system, the decision model employs a Markov Dependency network. Chittineni, however, does disclose the use of a Markov Dependency network (See col. 16 lines 16-25). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate this decision model within the system, as a way of modeling dependencies of errors of equations, such as the equations/formulas used to calculate the "wait" time that a call is expected to be held in queue before being answered by a customer service representative.

Response to Arguments

24. Applicant's arguments filed 04/10/2008 have been fully considered but they are not persuasive.

25. Applicants argue that Joseph, et al. and Bala, alone or in combination, fail to disclose or suggest a sequence of system actions from the incoming call as compared to system actions of more or more previous calls and re-determined after the

occurrence of each system action from the incoming call. Applicants further argue that Holt fails to disclose or suggest a sequence of system actions from the incoming call as compared to system actions of one or more previous calls and is re-determined after the occurrence of each system action from the incoming call. Applicants state that, Applicants' claims, recite routing calls based at least in part on actions of the incoming call, such as a user pressing a button, and the like.

26. In regards to Applicants' arguments, Examiner respectfully disagrees. For example, the system actions may be based on how successfully a customer service representative handled a call in the past pertaining to the selected product/service, or on what products/services were ordered by the customer in the past, (See Bala, col. 4 lines 30-65), and furthermore, Holt teaches that the system actions may be based on the probability of successfully routing the call, based on previous call attempts, (See col. 5 lines 20-33 and col. 7-8 lines 64-7). Holt further discloses and suggests that the system actions are re-determined (e.g., updated) after the occurrence of each system action (for example, the likelihood of success of reaching each destination number is updated after each destination is dialed) from the incoming call, to mitigate transferring the incoming call to an operator (e.g., subscriber) (See col. 4 lines 27-46 and col. 7-8 lines 64-10).

27. In regards to Applicants' argument that Applicants' claims, recite routing calls based at least in part on actions of the incoming call, such as a user pressing a button, and the like, Examiner respectfully disagrees. Applicant's claims merely recite "...routing the incoming call, the likelihood of success determined based in part on a

sequence of system actions from the incoming call..." The claims do not recite "a user pressing a button, and the like."

Conclusion

28. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

29. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to THJUAN K. ADDY whose telephone number is (571)272-7486. The examiner can normally be reached on Mon-Fri 8:30-5:00pm.

31. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ahmad Matar can be reached on (571) 272-7488. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

32. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thjuan K. Addy/
Primary Examiner, Art Unit 2614